SERVICE MANUAL

INTEGRATED STEREO AMPLIFIER

FISHER

CA-1224

EUROPE

132 306 44

This Service Manual is prepared for Model CA-1224. As only the components in the chart below differ, refer to the Service Manual CA-224 (WM-17165) for other components.

Ref. No.	CA-224	CA-1224	Description	Q'ty	Remark
	PACKAGE				
	131-6-1169-19901	131-6-1169-19902	Box Corrugate-Exp.	1	
	ACCESSORIES				
	142-6-4119-32973	142-6-4119-33027	Explanatory Booklet	1	
	CABINET				
6	141-0-1129-23901	141-0-1129-23902	Cabinet Front Assy	1	
	141-2-1129-49601	141-2-1129-49602	Cabinet Front	1	
13	131-2-3306-41101	131-2-3306-41102	Panel Rear	1	

Add this sheet to the Model CA-224 Service Manual (WM-17165).

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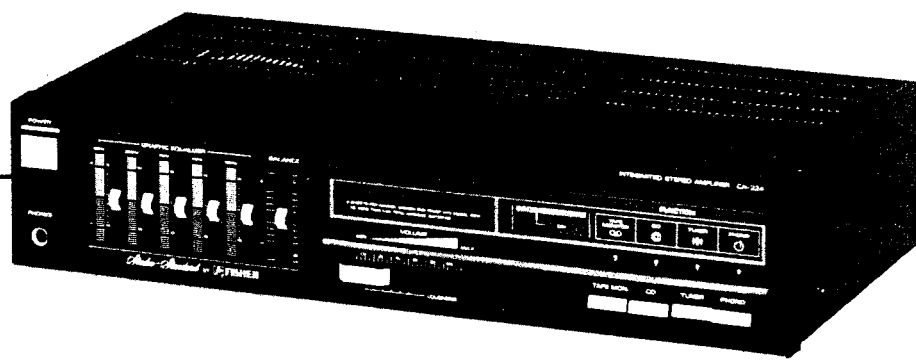
SERVICE MANUAL

FISHER

CA-224

Integrated Stereo Amplifier

(EUROPE)



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WM-1715 4/94

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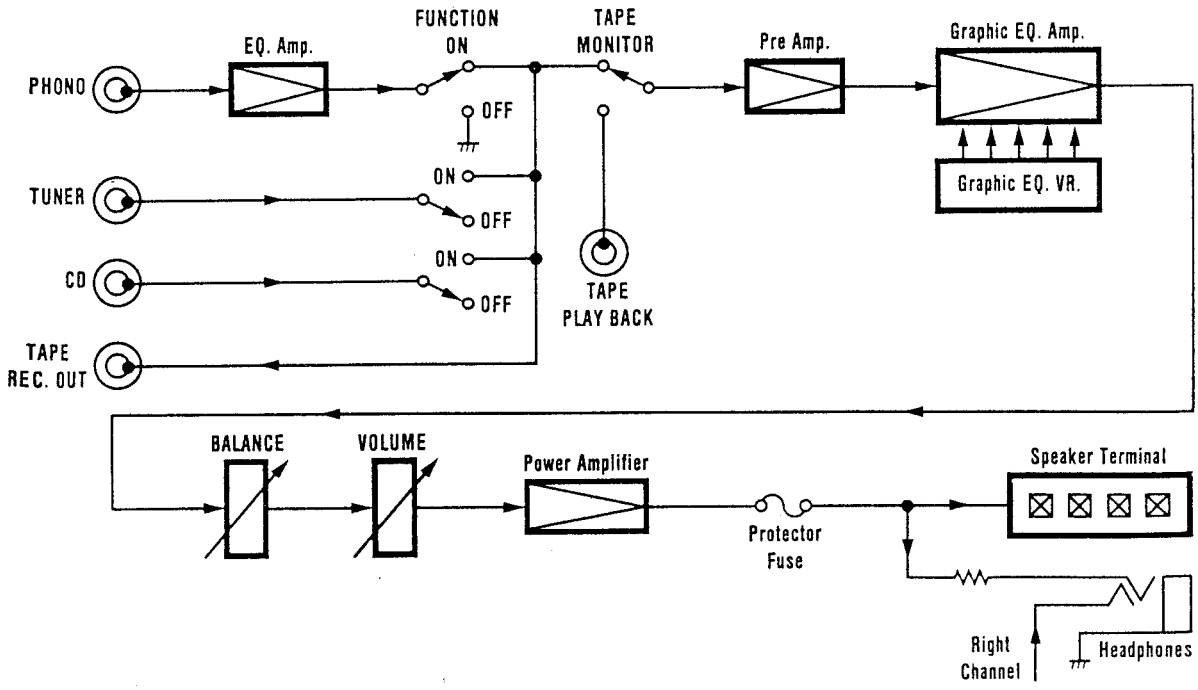
FUNCTIONAL BLOCK DIAGRAM



SPECIFICATIONS

AMPLIFIER		CA-224
POWER AMPLIFIER SECTION **Minimum RMS sine wave power per channel within stated bandwidth at no more than stated distortion and with 8-ohm load**		35 Watts
Power Bandwidth		20 Hz – 20 kHz
Total Harmonic Distortion		0.5 %
I.M. Distortion		0.5 %
Speaker Damping		> 20
PREAMPLIFIER SECTION Frequency Response		
	Phono (RIAA)	±1 dB
	Aux (20 Hz – 20 kHz)	±1 dB
Input Sensitivity and Impedance		
	Phono	2.5 mV/50 kΩ
	Tape Monitor	150 mV/50 kΩ
	Tuner/CD	150 mV/50 kΩ
Phono Max. Input Capability		150 mV
Graphic Equalizer		
	63 Hz	±10 dB
	250 Hz	±10 dB
	1 kHz	±10 dB
	4 kHz	±10 dB
	16 kHz	±10 dB
Hum & Noise (IHF Short Circuit, A Network)		
	Phono	68 dB
	Tape Monitor	85 dB
	Tuner/CD	85 dB
GENERAL Power Requirements (50 Hz)		220 V AC
Power Consumption		180 Watts
Dimensions (W x H x D)		400 x 91 x 202 mm
Weight (approx.)		4.1kg

Because its products are subject to continuous improvement, Fisher Corporation reserves the right to modify product designs and specifications without notice and without incurring any obligation.

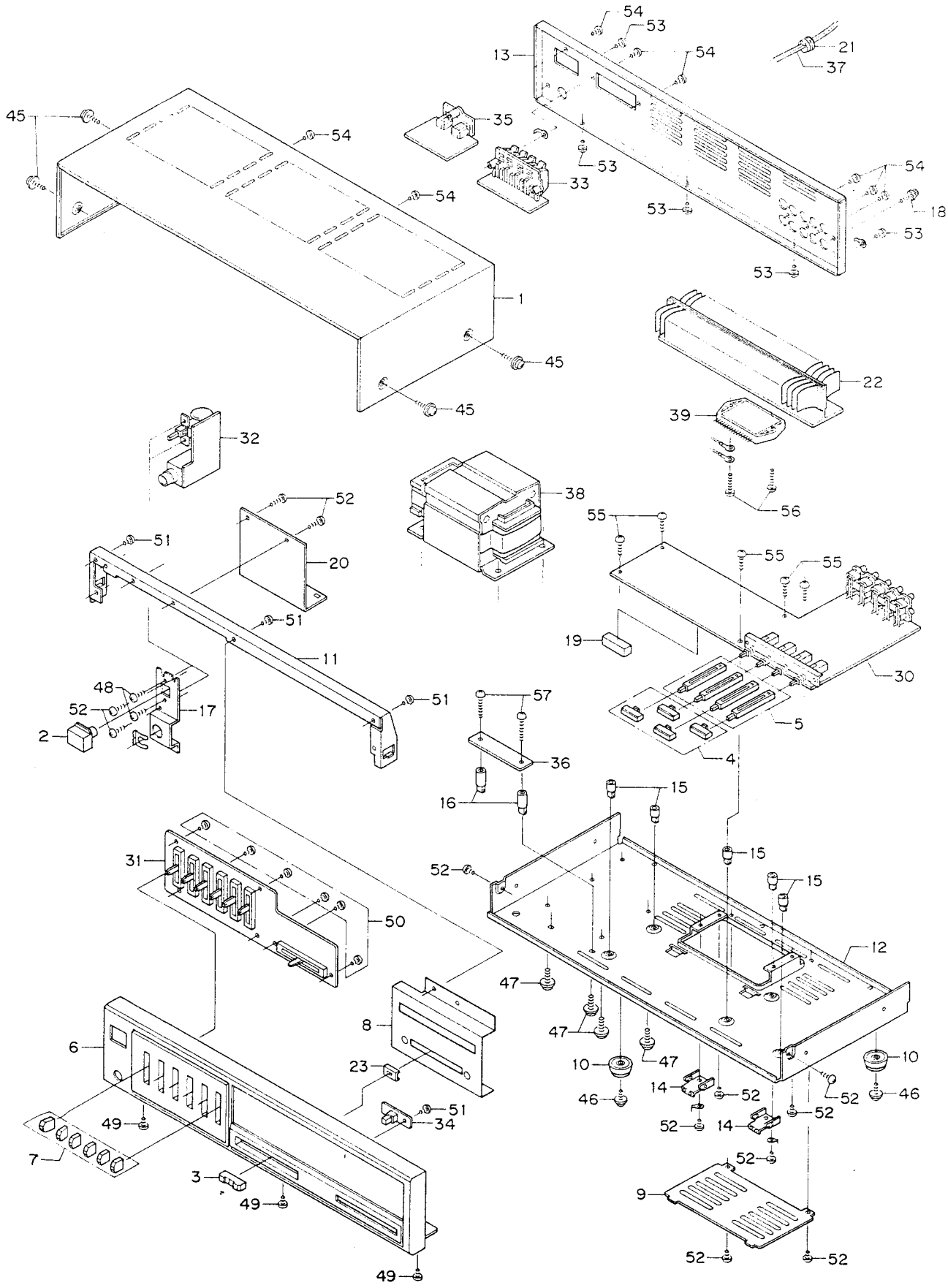
IMPORTANT NOTE

The amplifier has been Factory-adjusted for operation on 220V AC. The voltage can be changed for operation on 110V AC by making the following changes on the amplifier inside.

1. Remove the AC plug from the wall outlet.
2. Remove the screws securing the cover.
3. Disconnect Gray lead from AC Select P.C.Board Terminal No. 19, and then connect it to AC Select P.C.Board Terminal No. 16.
4. Disconnect Yellow lead from AC Select P.C.Board Terminal No. 19, and then connect it to AC Select P.C.Board Terminal No. 18.

The amplifier is now ready 110V operation. DO NOT attempt to operate the amplifier on 220V. Damage will result!

CABINET & CHASSIS EXPLODED VIEW



CABINET & CHASSIS PARTS LIST

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

Ref. No.	Part No.	Description	Q'ty
	PACKING PARTS LIST		
	131-6-1169-19901	Box Corrugate-Exp.	1
	131-6-3009-36250	Pad (Left)	1
	131-6-3009-36260	Pad (Right)	1
	131-6-3069-16350	Patching Sheet	1
	131-6-4559-11200	Serial No. Sheet	2
	141-6-2519-22390	Sheet Polyethylene	1
	ACCESSORIES PARTS LIST		
	131-6-2719-10401	Bag Fan	1
	142-6-4119-32973	Explanatory Booklet	1
	CABINET & CHASSIS PARTS LIST		
	4-2379-21520	Terminal Lug	1
	4-2379-21524	Terminal Lug	1
	131-6-4559-11200	Serial No. Sheet	1
1	131-2-1410-34400	Cover	1
2	131-2-1601-86200	Knob (Power)	1
3	131-2-1601-86504	Knob (Volume)	1
4	131-2-1601-96700	Knob (Function)	4
5	131-2-4219-20200	Shaft	4
6	141-0-1129-23901	Cabinet Front Assy	1
	131-2-1110-39604	Plate Decorate	1
	131-2-1110-40300	Plate Decorate EQ.	1
	131-2-1801-16200	Leg	2
	141-2-1129-49601	Cabinet Front	1
7	141-2-1659-35900	Knob Slide (EQ., Balance)	6
8	141-2-3229-60000	Plate Shield	1
9	131-2-1410-34900	Cover Bottom	1
10	131-2-1801-12900	Leg	2
11	131-2-3202-15900	Metal Reinforce	1
12	131-2-3301-32300	Chassis	1
13	131-2-3306-41101	Panel Rear	1
14	131-2-3310-18400	Metal Support	2
15	131-2-3614-20300	Mount P.C.B.	5
16	131-2-3614-21800	Mount P.C.B.	2
17	131-2-3701-30800	Mount Electric Part	1
18	131-2-4201-17800	Screw Ground	1
19	131-2-5205-34900	Cushion	1
20	131-2-6101-31800	Plate Shield	1
21	131-2-6111-14200	Bushing (4N-4)	1
22	131-2-6201-37800	Plate Heat Sink	1
23	141-2-3229-60100	Plate Earth	1

Ref. No.	Part No.	Description	Q'ty
	ELECTRICAL PARTS LIST		
30	141-0-1939-17761	Main Amp. P.C.B. Assy	1
31	141-0-1939-17770	Control Amp. P.C.B. Assy	1
32	141-0-1939-17781	Power Switch P.C.B. Assy	1
33	141-0-1939-17790	Speaker Out P.C.B. Assy	1
34	141-0-1939-17800	Power Ind. P.C.B. Assy	1
35	141-0-1939-17810	Socket 2P P.C.B. Assy	1
36	141-0-1939-17820	AC Select P.C.B. Assy	1
37	⚠ 4-2432-00501	Power Cord	1
38	⚠ 4-2512-33320	Power Trans	1
39	205-5-3834-15240	IC, STK 4152 MK2 [IC301]	1
	SCREW PARTS LIST		
45	141-2-4219-33101	Screw, Bind Hd. Tapping-B. +M3.0x8 Sems	4
46	131-2-4201-25200	Screw, Brazier Hd. Tapping-B. +M3.0x6 Sems	2
47	141-2-4219-43300	Screw, Bind Hd. Tapping-C. +M4.0x10 Sems	4
48	101-3-1303-00611	Screw, Pan Hd., +M3.0x6	2
49	143-3-1703-00818	Screw, Bind Hd. Tapping-B. +M3.0x8	3
50	143-3-1302-60811	Screw, Pan Hd. Tapping-B. +M2.6x8	6
51	143-3-1902-60811	Screw, Brazier Hd. Tapping-B. +M2.6x8	4
52	143-3-1903-00611	Screw, Brazier Hd. Tapping-B. +M3.0x6	12
53	143-3-1903-00618	Screw, Brazier Hd. Tapping-B. +M3.0x6	5
54	143-3-1903-00818	Screw, Brazier Hd. Tapping-B. +M3.0x8	8
55	143-3-1903-01211	Screw, Brazier Hd. Tapping-B. +M3.0x12	5
56	143-3-1903-01611	Screw, Brazier Hd. Tapping-B. +M3.0x16	2
57	143-3-1903-02011	Screw, Brazier Hd. Tapping-B. +M3.0x20	2
C701	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80-20%	1
C702	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80-20%	1

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

RECOMMENDED TEST EQUIPMENTS

The following test equipments are recommended to completely test and align the Amplifier:

- Line Voltage Isolation Transformer
- AC DC Multimeter
- Accurately Calibrated AC Voltmeter
- Oscilloscope (Flat to 100 kHz Minimum)
- Low-Distortion Audio Sine-Wave Generator
- Harmonic Distortion Analyzer
- Two (2) Load Resistors 8-ohms, 250 Watts (Minimum Rating)

HARMONIC DISTORTION TEST

CAUTION: Limit the following tests to no more than ten minutes each. Use 8-ohm resistors, with a minimum power rating of 250 watts when connecting a load across the SPEAKERS terminal.

CONTROL SETTINGS:

Unplug the AC power cord and set the front panel controls as follows:

- GRAPHIC EQUALIZER to center position.
- BALANCE control to center position.
- POWER switch to OFF
- FUNCTION switch to CD
- VOLUME control to MINIMUM position
- LEFT CHANNEL DRIVEN

ONE CHANNEL DRIVEN:

1) Connect a low distortion audio generator to LEFT CD IN jack. Set generator frequency to 1 kHz and output to minimum.

2) Connect an 8-ohm load resistor between SPEAKERS SYSTEM LEFT and COM terminals. Connect a Harmonic Distortion Analyzer and an AC VTVM in parallel across the 8-ohm load.

3) Connect the AC power cord. Turn VOLUME control to MAX.

4) Increase generator output for 35 Watts RMS (16.7 volts across the 8-ohm load). Harmonic Distortion Analyzer should measure 0.5 % distortion or less.

5) Repeat steps 1 through 4 for RIGHT CHANNEL.

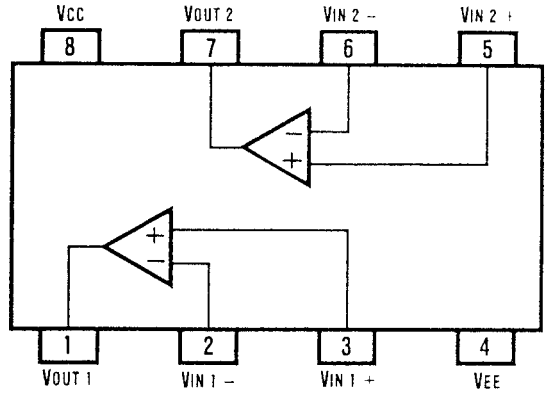
BOTH CHANNELS DRIVEN

Connect 8-ohm load resistors across LEFT and RIGHT SPEAKERS SYSTEM terminals. Adjust generator output and "VOLUME" control for 35 watts at Left and Right Channels (16.7 volts across the 8-ohm loads). Harmonic Distortion Analyzer should measure 0.5 % distortion or less at each channel.

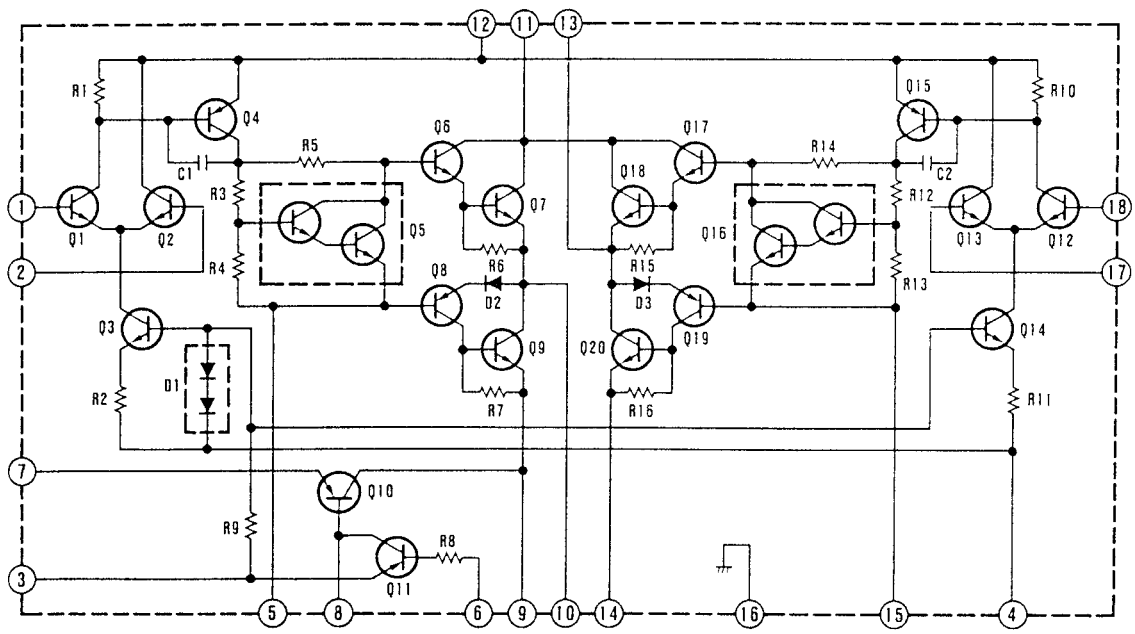
CAUTION: This precision high-fidelity instrument should be serviced only by qualified personnel, trained in the repair of transistor equipment and printed circuitry.

INTEGRATED CIRCUIT BLOCK DIAGRAM

PHONO / GRAPHIC EQUALIZER AMP IC LA 6458 D



STK 4152 MK2 EQUIVALENT CIRCUIT



P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description				Q'ty
	MAIN AMP. P.C.B. ASSY					
30	141-0-1939-17761	Main Amp. P.C.B. Assy				1
	4-2262-29520	Main Amp. P.C.B.				1
S1	4-2319-79560	Push Switch 4Key (Function, Tape Monitor)				1
L301	4-2532-00420	RF Filter (5μH)				1
L302	4-2532-00420	RF Filter (5μH)				1
	⚠ 4-2349-20570	Fuse T2.5A				2
	⚠ 4-2349-20580	Fuse T3.15A				2
	4-2352-01700	Pin Jack 4P (Tape)				1
	4-2352-01780	Pin Jack 6P (Phono, Tuner, CD)				1
	4-2352-01940	Fuse Clip				8
	111-2-6220-11100	Wire Wrap Terminal				3
	131-2-7103-52607	Label Fuse T3.15Ax2				1
	131-2-7103-52610	Label Fuse T2.5Ax2				1
	CAPACITORS					
C101	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C102	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C103	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C104	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C105	CD4-7-5250-0001V	Electrolytic	4.7μF	25V		1
C106	CD4-7-5250-0001V	Electrolytic	4.7μF	25V		1
C107	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C108	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C109	CD4-7-6100-0001V	Electrolytic	47μF	10V		1
C110	CD4-7-6100-0001V	Electrolytic	47μF	10V		1
C111	CM1-8-3500-K00SV	Mylar	0.018μF	50V	±10%	1
C112	CM1-8-3500-K00SV	Mylar	0.018μF	50V	±10%	1
C113	CM4-7-2500-J00SV	Mylar	0.0047μF	50V	±5%	1
C114	CM4-7-2500-J00SV	Mylar	0.0047μF	50V	±5%	1
C115	CD1-0-5500-0001V	Electrolytic	1μF	50V		1
C116	CD1-0-5500-0001V	Electrolytic	1μF	50V		1
C117	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C118	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C119	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C120	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C121	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C122	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C123	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C124	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C125	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C126	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C127	CD4-7-6160-0001V	Electrolytic	47μF	16V		1
C128	CD4-7-6160-0001V	Electrolytic	47μF	16V		1
C129	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80 -20%	1
C130	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80 -20%	1
C131	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C132	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C140	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80 -20%	1
C301	CC2-2-1500-KE01R	Ceramic	220pF	50V	±10%	1
C302	CC2-2-1500-KE01R	Ceramic	220pF	50V	±10%	1
C303	CC2-2-1500-KE01R	Ceramic	220pF	50V	±10%	1
C304	CC2-2-1500-KE01R	Ceramic	220pF	50V	±10%	1
C305	CC2-2-1500-KE01R	Ceramic	220pF	50V	±10%	1
C306	CC2-2-1500-KE01R	Ceramic	220pF	50V	±10%	1
C307	CD4-7-663A-0001V	Electrolytic	47μF	6.3V		1
C308	CD4-7-663A-0001V	Electrolytic	47μF	6.3V		1
C309	CD4-7-6500-0001V	Electrolytic	47μF	50V		1
C310	CD4-7-6500-0001V	Electrolytic	47μF	50V		1
C311	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80 -20%	1
C312	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80 -20%	1
C313	CD1-0-6500-0001V	Electrolytic	10μF	50V		1
C314	CD1-0-6500-0001V	Electrolytic	10μF	50V		1
C315	CD1-0-7500-0001V	Electrolytic	100μF	50V		1
C316	CD1-0-7500-0001V	Electrolytic	100μF	50V		1
C317	CD1-0-6500-0001V	Electrolytic	10μF	50V		1
C318	CB4-7-5500-0000V	None-polar	4.7μF	50V		1
C319	CD2-2-7250-0001V	Electrolytic	220μF	25V		1
C320	CD4-7-6350-0001V	Electrolytic	47μF	35V		1
C401	CC4-7-3151-ZG00C	Ceramic	0.047μF	150V	+80 -20%	1
C402	CC4-7-3151-ZG00C	Ceramic	0.047μF	150V	+80 -20%	1
C403	CC4-7-3151-ZG00C	Ceramic	0.047μF	150V	+80 -20%	1
C404	CC4-7-3151-ZG00C	Ceramic	0.047μF	150V	+80 -20%	1
C405	CD3-3-8500-0005V	Electrolytic	3300μF	50V		1
C406	CD3-3-8500-0005V	Electrolytic	3300μF	50V		1
C407	CD4-7-5250-0001V	Electrolytic	4.7μF	25V		1
C408	CD4-7-5250-0001V	Electrolytic	4.7μF	25V		1
C703	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80 -20%	1
C704	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80 -20%	1
C705	CC1-0-1500-KD00C	Ceramic	100pF	50V	±10%	1
C706	CC1-0-1500-KD00C	Ceramic	100pF	50V	±10%	1
C707	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80 -20%	1
C708	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80 -20%	1
	SEMICONDUCTORS					
D101	202-5-1410-00110	Diode, GMA 01				1
D102	202-5-1410-00110	Diode, GMA 01				1
D201	202-5-9600-44610	Diode, DS 446				1
D301	202-5-9600-44610	Diode, DS 446				1
D302	205-5-9040-44210	Diode, DS 442				1
D401	212-5-9360-01258	Diode, DSA 12B				1
D402	212-5-9360-01258	Diode, DSA 12B				1
D403	212-5-9360-01258	Diode, DSA 12B				1
D404	212-5-9360-01258	Diode, DSA 12B				1
D405	202-5-3210-18012	Zener Diode, GZA 18Y				1
D406	202-5-3210-18012	Zener Diode, GZA 18Y				1
D601	202-5-3210-27012	Zener Diode, GZA 27Y				1
IC101	206-5-2726-45810	IC, LA 6458 DS				1
Q301	203-5-5000-53670	Transistor, 2SC 536				1
Q401	203-5-7252-27460	Transistor, 2SC 2274				1
Q402	203-5-6820-98460	Transistor, 2SA 984				1
	RESISTORS					
R101	401 025 7805	CARBON 2.2K JA 1/6W				1
R102	401 025 7805	CARBON 2.2K JA 1/6W				1
R103	401 024 7707	CARBON 100K JA 1/6W				1
R104	401 024 7707	CARBON 100K JA 1/6W				1
R105	401 024 7707	CARBON 100K JA 1/6W				1
R106	401 024 7707	CARBON 100K JA 1/6W				1
R107	401 026 3905	CARBON 330 JA 1/6W				1
R108	401 026 3905	CARBON 330 JA 1/6W				1
R109	401 025 8703	CARBON 220K JA 1/6W				1
R110	401 025 8703	CARBON 220K JA 1/6W				1
R111	401 025 1902	CARBON 15K JA 1/6W				1
R112	401 025 1902	CARBON 15K JA 1/6W				1
R113	401 024 7707	CARBON 100K JA 1/6W				1
R114	401 024 7707	CARBON 100K JA 1/6W				1
R115	401 012 5708	CARBON 1K JA 1/4W				1
R116	401 012 5708	CARBON 1K JA 1/4W				1
R117	401 012 5708	CARBON 1K JA 1/4W				1
R118	401 012 5708	CARBON 1K JA 1/4W				1
R119	401 012 5708	CARBON 1K JA 1/4W				1
R120	401 012 5708	CARBON 1K JA 1/4W				1
R121	401 012 5708	CARBON 1K JA 1/4W				1
R122	401 012 5708	CARBON 1K JA 1/4W				1
R123	401 012 5708	CARBON 1K JA 1/4W				1
R124	401 012 5708	CARBON 1K JA 1/4W				1
R125	401 016 2604	CARBON 220 JA 1/4W				1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
R126	401 016 2604	CARBON 220 JA 1/4W	1
R255	401 016 2604	CARBON 220 JA 1/4W	1
R301	401 024 7004	CARBON 1K JA 1/6W	1
R302	401 024 7004	CARBON 1K JA 1/6W	1
R303	401 027 3003	CARBON 56K JA 1/6W	1
R304	401 027 3003	CARBON 56K JA 1/6W	1
R305	401 026 3905	CARBON 330 JA 1/6W	1
R306	401 026 3905	CARBON 330 JA 1/6W	1
R307	401 021 4105	CARBON 56K JA 1/4W	1
R308	401 021 4105	CARBON 56K JA 1/4W	1
R309	401 083 9506	CARBON 3.3K JA 1/4W	1
R310	401 083 9506	CARBON 3.3K JA 1/4W	1
R311	401 085 6008	OXIDE-MT 3.3K JB 1/2W	1
R312	401 085 6008	OXIDE-MT 3.3K JB 1/2W	1
R313	401 054 7500	OXIDE-MT 10 JB 1/2W	1
R314	401 054 7500	OXIDE-MT 10 JB 1/2W	1
R315	401 012 4503	CARBON 100 JA 1/4W	1
R316	401 012 4503	CARBON 100 JA 1/4W	1
R317	402 015 3104	FUSIBLE RES 100 J- 1/4W	1
R318	402 015 3104	FUSIBLE RES 100 J- 1/4W	1
R319	401 058 3805	OXIDE-MT 1K JB 1W	1
R320	401 058 3805	OXIDE-MT 1K JB 1W	1
R321	401 019 3004	CARBON 39K JA 1/4W	1
R322	401 027 9005	CARBON 82K JA 1/6W	1
R323	401 027 0309	CARBON 47K JA 1/6W	1
R324	401 012 7009	CARBON 10K JA 1/4W	1
R401	401 085 5902	OXIDE-MT 180 JB 1/2W	1
R402	401 085 5902	OXIDE-MT 180 JB 1/2W	1
R403	401 016 3809	CARBON 2.2K JA 1/4W	1
R404	401 016 3809	CARBON 2.2K JA 1/4W	1
R601	401 058 3805	OXIDE-MT 1K JB 1W	1

CONTROL AMP. P.C.B. ASSY

31	141-0-1939-17770	Control Amp. P.C.B. Assy	1
	4-2262-29530	Control Amp. P.C.B.	1
VR201	4-2229-75750	Slide Volume (SW-250kΩx2, 63Hz)	1
VR202	4-2229-75750	Slide Volume (SW-250kΩx2, 250Hz)	1
VR203	4-2229-75750	Slide Volume (SW-250kΩx2, 1kHz)	1
VR204	4-2229-75750	Slide Volume (SW-250kΩx2, 4kHz)	1
VR205	4-2229-75750	Slide Volume (SW-250kΩx2, 16kHz)	1
VR206	4-2229-75760	Slide Volume (W-200kΩ, Balance)	1
VR207	4-2229-76210	Slide Volume (A-100kΩx2, Volume)	1

CAPACITORS

C201	CC1-0-1500-KD00C	Ceramic	100pF	50V	±10%	1
C202	CC1-0-1500-KD00C	Ceramic	100pF	50V	±10%	1
C203	CD1-0-5500-0002V	Electrolytic	1μF	50V		1
C204	CD1-0-5500-0002V	Electrolytic	1μF	50V		1
C205	CC6-8-0500-KD00C	Ceramic	68pF	50V	±10%	1
C206	CC6-8-0500-KD00C	Ceramic	68pF	50V	±10%	1
C207	CC1-0-0500-DD00C	Ceramic	10pF	50V	±0.5%	1
C208	CC1-0-0500-DD00C	Ceramic	10pF	50V	±0.5%	1
C209	CD1-0-6160-0002V	Electrolytic	10μF	16V		1
C210	CD1-0-6160-0002V	Electrolytic	10μF	16V		1
C211	CD2-2-5500-0002V	Electrolytic	2.2μF	50V		1
C212	CD2-2-5500-0002V	Electrolytic	2.2μF	50V		1
C213	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C214	CC2-2-1500-KD00C	Ceramic	220pF	50V	±10%	1
C215	CM1-8-3500-K00BV	Mylar	0.018μF	50V	±10%	1
C216	CM1-8-3500-K00BV	Mylar	0.018μF	50V	±10%	1
C217	CD3-3-5500-0002V	Electrolytic	3.3μF	50V		1
C218	CD3-3-5500-0002V	Electrolytic	3.3μF	50V		1
C219	CM8-2-2500-K00BV	Mylar	0.0082μF	50V	±10%	1
C220	CM8-2-2500-K00BV	Mylar	0.0082μF	50V	±10%	1
C221	CD4-7-4500-0002V	Electrolytic	0.47μF	50V		1
C222	CD4-7-4500-0002V	Electrolytic	0.47μF	50V		1
C223	CM4-7-2500-K00BV	Mylar	0.0047μF	50V	±10%	1
C224	CM4-7-2500-K00BV	Mylar	0.0047μF	50V	±10%	1
C225	CM8-2-3500-J00TV	Mylar	0.082μF	50V	±5%	1
C226	CM8-2-3500-J00TV	Mylar	0.082μF	50V	±5%	1
C227	CM1-5-2500-K00BV	Mylar	0.0015μF	50V	±10%	1
C228	CM1-5-2500-K00BV	Mylar	0.0015μF	50V	±10%	1
C229	CM2-2-3500-K00BV	Mylar	0.022μF	50V	±10%	1
C230	CM2-2-3500-K00BV	Mylar	0.022μF	50V	±10%	1
C231	CC6-8-1500-KE00C	Ceramic	680pF	50V	±10%	1
C232	CC6-8-1500-KE00C	Ceramic	680pF	50V	±10%	1
C233	CM4-7-2500-K00BV	Mylar	0.0047μF	50V	±10%	1
C234	CM4-7-2500-K00BV	Mylar	0.0047μF	50V	±10%	1
C237	CC2-7-1500-KE00C	Ceramic	270pF	50V	±10%	1
C238	CC2-7-1500-KE00C	Ceramic	270pF	50V	±10%	1
C239	CM3-9-3500-K00BV	Mylar	0.039μF	50V	±10%	1
C240	CM3-9-3500-K00BV	Mylar	0.039μF	50V	±10%	1
C241	CD2-2-5500-0002V	Electrolytic	2.2μF	50V		1
C242	CD2-2-5500-0002V	Electrolytic	2.2μF	50V		1
C253	CD4-7-6160-0002V	Electrolytic	47μF	16V		1
C254	CD2-2-7250-0001V	Electrolytic	220μF	25V		1
C255	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80 -20%	1
C256	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80 -20%	1

SEMICONDUCTORS

IC201	206-5-2726-45810	IC, LA 6458 DS	1
Q201	203-5-5000-53670	Transistor, 2SC 536	1
Q202	203-5-5000-53670	Transistor, 2SC 536	1
Q203	203-5-5000-53670	Transistor, 2SC 536	1
Q204	203-5-5000-53670	Transistor, 2SC 536	1
Q205	203-5-5000-53670	Transistor, 2SC 536	1
Q206	203-5-5000-53670	Transistor, 2SC 536	1
Q207	203-5-5000-53670	Transistor, 2SC 536	1
Q208	203-5-5000-53670	Transistor, 2SC 536	1
Q209	203-5-5000-53670	Transistor, 2SC 536	1
Q210	203-5-5000-53670	Transistor, 2SC 536	1

RESISTORS

R201	401 025 1605	CARBON 1.5K JA 1/6W	1
R202	401 025 1605	CARBON 1.5K JA 1/6W	1
R203	401 024 7707	CARBON 100K JA 1/6W	1
R204	401 024 7707	CARBON 100K JA 1/6W	1
R205	401 026 9907	CARBON 4.7K JA 1/6W	1
R206	401 026 9907	CARBON 4.7K JA 1/6W	1
R207	401 026 9907	CARBON 4.7K JA 1/6W	1
R208	401 026 9907	CARBON 4.7K JA 1/6W	1
R209	401 026 9907	CARBON 4.7K JA 1/6W	1
R210	401 026 9907	CARBON 4.7K JA 1/6W	1
R211	401 026 6609	CARBON 390 JA 1/6W	1
R212	401 026 6609	CARBON 390 JA 1/6W	1
R213	401 025 1902	CARBON 15K JA 1/6W	1
R214	401 025 1902	CARBON 15K JA 1/6W	1
R215	401 025 0004	CARBON 120K JA 1/6W	1
R216	401 025 0004	CARBON 120K JA 1/6W	1
R217	401 024 9305	CARBON 1.2K JA 1/6W	1
R218	401 024 9305	CARBON 1.2K JA 1/6W	1
R219	401 026 6609	CARBON 390 JA 1/6W	1
R220	401 026 6609	CARBON 390 JA 1/6W	1
R221	401 025 1902	CARBON 15K JA 1/6W	1
R222	401 025 1902	CARBON 15K JA 1/6W	1
R223	401 024 7707	CARBON 100K JA 1/6W	1
R224	401 024 7707	CARBON 100K JA 1/6W	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
R225	401 024 9305	CARBON 1.2K JA 1/6W	1
R226	401 024 9305	CARBON 1.2K JA 1/6W	1
R227	401 026 6609	CARBON 390 JA 1/6W	1
R228	401 026 6609	CARBON 390 JA 1/6W	1
R229	401 025 1902	CARBON 15K JA 1/6W	1
R230	401 025 1902	CARBON 15K JA 1/6W	1
R231	401 026 7408	CARBON 39K JA 1/6W	1
R232	401 026 7408	CARBON 39K JA 1/6W	1
R233	401 025 1605	CARBON 1.5K JA 1/6W	1
R234	401 025 1605	CARBON 1.5K JA 1/6W	1
R235	401 026 6609	CARBON 390 JA 1/6W	1
R236	401 026 6609	CARBON 390 JA 1/6W	1
R237	401 025 1902	CARBON 15K JA 1/6W	1
R238	401 025 1902	CARBON 15K JA 1/6W	1
R239	401 026 4605	CARBON 33K JA 1/6W	1
R240	401 026 4605	CARBON 33K JA 1/6W	1
R241	401 025 1605	CARBON 1.5K JA 1/6W	1
R242	401 025 1605	CARBON 1.5K JA 1/6W	1
R243	401 026 6609	CARBON 390 JA 1/6W	1
R244	401 026 6609	CARBON 390 JA 1/6W	1
R245	401 025 1902	CARBON 15K JA 1/6W	1
R246	401 025 1902	CARBON 15K JA 1/6W	1
R247	401 025 8208	CARBON 22K JA 1/6W	1
R248	401 025 8208	CARBON 22K JA 1/6W	1
R249	401 025 1605	CARBON 1.5K JA 1/6W	1
R250	401 025 1605	CARBON 1.5K JA 1/6W	1
R251	401 027 5502	CARBON 6.8K JA 1/6W	1
R252	401 027 5502	CARBON 6.8K JA 1/6W	1
R253	401 024 7004	CARBON 1K JA 1/6W	1
R254	401 024 7004	CARBON 1K JA 1/6W	1
R257	401 024 7707	CARBON 100K JA 1/6W	1
R258	401 024 7707	CARBON 100K JA 1/6W	1
	POWER SWITCH P.C.B. ASSY		
32	141-0-1939-17781	Power Switch P.C.B. Assy	1
	4-2262-29540	Power Switch P.C.B.	1
S2	⚠ 4-2312-05710	Switch Push Power (Power)	1
	4-2352-01170	Jack 7P 6.45 (Headphones)	1
	111-2-6220-11100	Wire Wrap Terminal	2
	131-2-6114-01400	Cover Safty	1
	CAPACITOR		
C801	⚠ 4-2239-70970	Capacitor 0.01μF 400V	1
	RESISTORS		
R501	401 055 9503	OXIDE-MT 330 JB 1/2W	1
R502	401 055 9503	OXIDE-MT 330 JB 1/2W	1
R503	401 014 2903	CARBON 150 JA 1/4W	1
R504	401 014 2903	CARBON 150 JA 1/4W	1
	SPEAKER OUT P.C.B. ASSY		
33	141-0-1939-17790	Speaker Out P.C.B. Assy	1
	4-2262-29550	Speaker Out P.C.B.	1
	4-2379-70820	4P Push Terminal (Speaker)	1
	CAPACITORS		
C501	CC1-0-2500-KE00R	Ceramic 0.001μF 50V ±10%	1
C502	CC1-0-2500-KE00R	Ceramic 0.001μF 50V ±10%	1
	POWER IND. P.C.B. ASSY		
34	141-0-1939-17800	Power Ind. P.C.B. Assy	1
	4-2262-29560	Power Ind. P.C.B.	1
	131-2-4208-41300	Spacer (Led)	1
	SEMICONDUCTOR		
D602	4-2029-72101	L.E.D., GL 9 PR 54 (Power)	1
	SOCKET 2P P.C.B. ASSY		
35	141-0-1939-17810	Socket 2P P.C.B. Assy	1
	4-2262-29570	Socket 2P P.C.B.	1
	⚠ 4-2349-20380	Fuse T1.0A	2
	4-2352-01940	Fuse Clip	4
	⚠ 4-2359-79090	Socket 2P-2 (Power Supply)	1
	111-2-6220-11100	Wire Wrap Terminal	4
	AC SELECT P.C.B. ASSY		
36	141-0-1939-17820	AC Select P.C.B. Assy	1
	4-2262-29580	AC Select P.C.B.	1
	4-2372-00830	EC Terminal 1P	2
	111-2-6220-11100	Wire Wrap Terminal	4

NOTES:

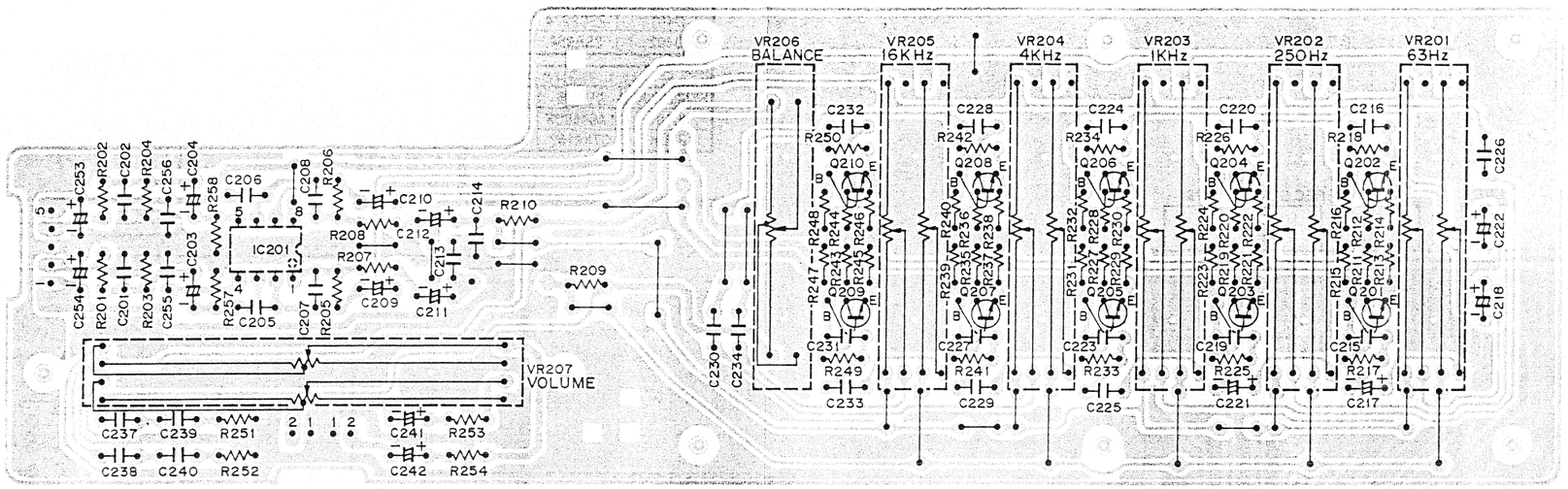
1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

CONTROL AMPLIFIER P.C.BOARD

(BOTTOM VIEW)

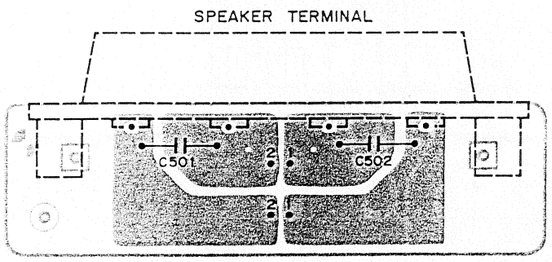


IC PIN NUMBERS DC VOLTAGES									
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8
IC201	LA6458DS	0V	0V	0V	-16.5V	0V	0V	0V	16.5V

TRANSISTOR DC VOLTAGES									
SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q201,202	2SC536	-0.4V	16.2V	-1.0V	Q207,208	2SC536	-0.1V	16.2V	-0.7V
Q203,204	2SC536	-0.3V	16.2V	-0.9V	Q209,210	2SC536	-0.1V	16.2V	-0.7V
Q205,206	2SC536	-0.1V	16.2V	-0.7V					

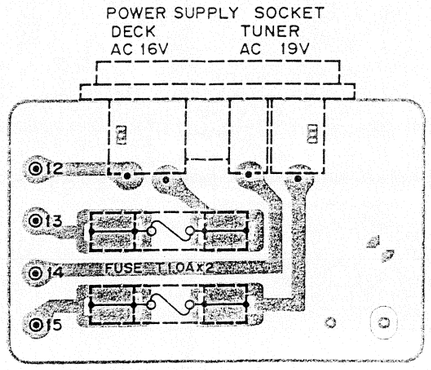
SPEAKER OUT P.C.BOARD

(BOTTOM VIEW)



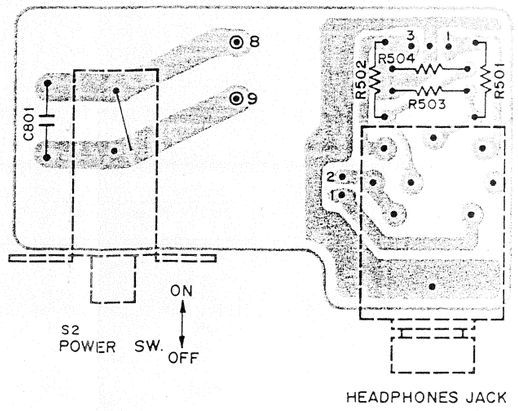
SOCKET 2P P.C.BOARD

(BOTTOM VIEW)



POWER SWITCH P.C.BOARD

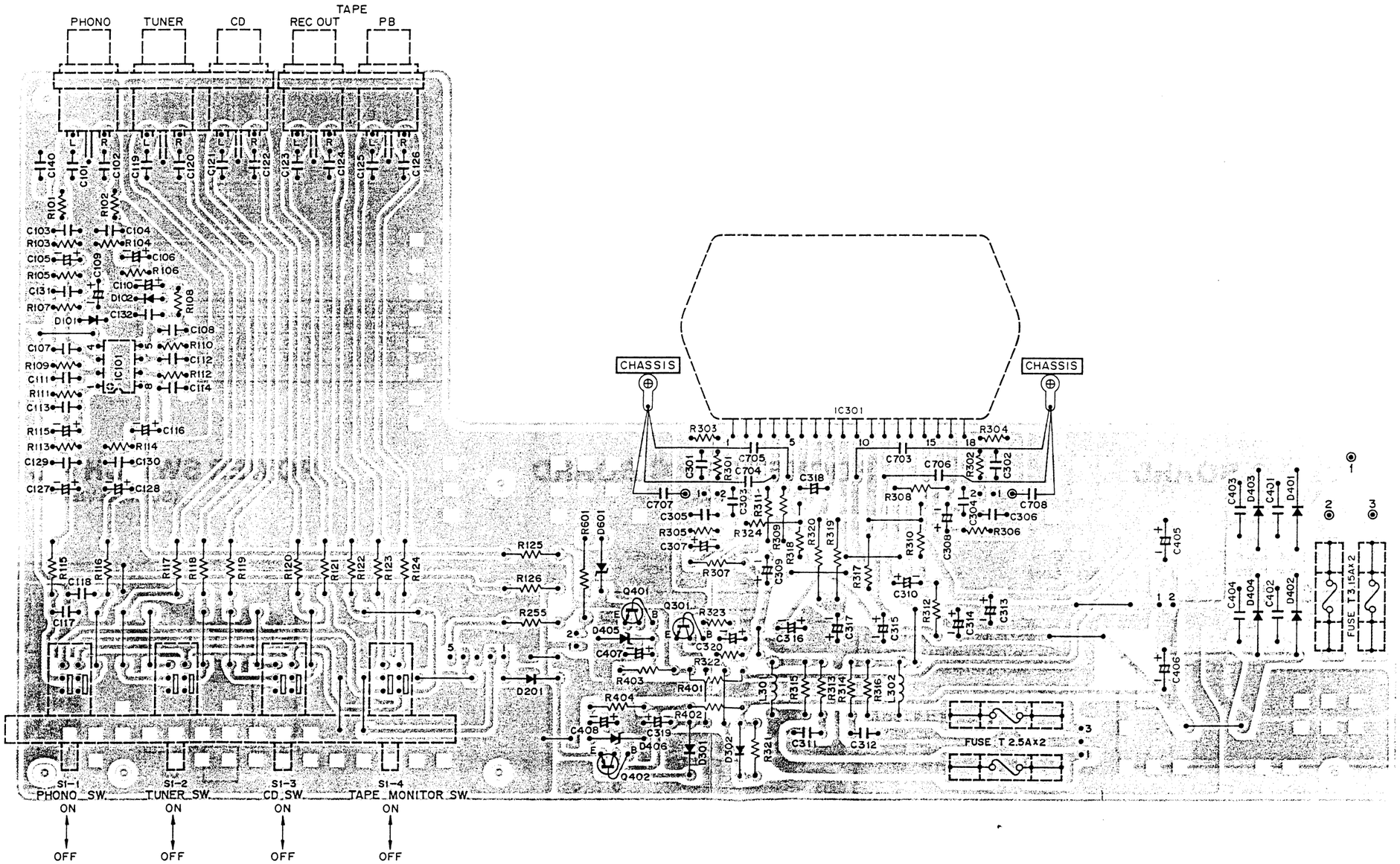
(BOTTOM VIEW)



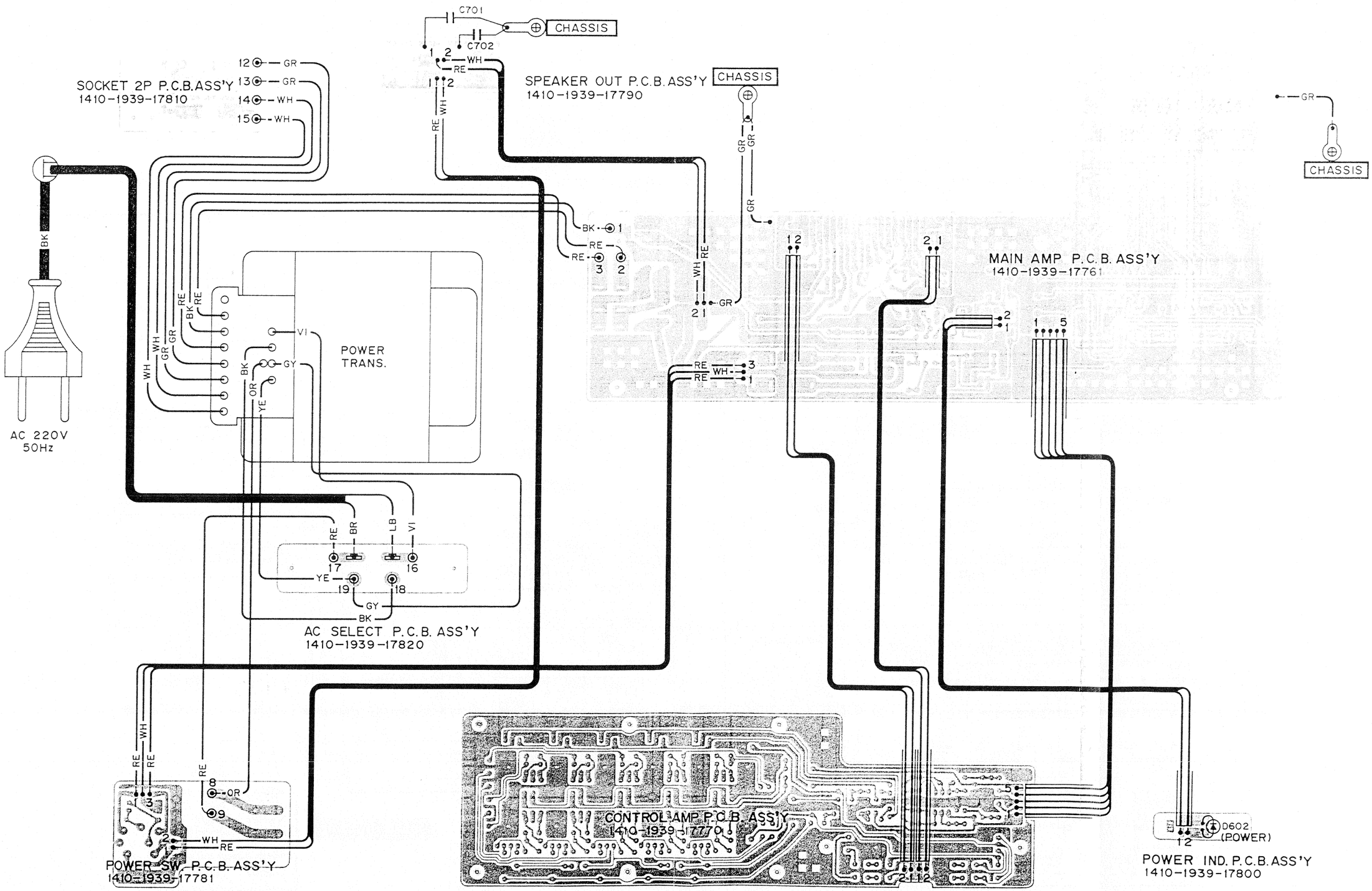
MAIN PRINTED CIRCUIT BOARD

TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q301	2SC536	-24.7V	0V	-17.6V
Q401	2SC2274	18.5V	31.2V	18.0V
Q402	2SA984	-18.5V	-31.3V	-18.0V

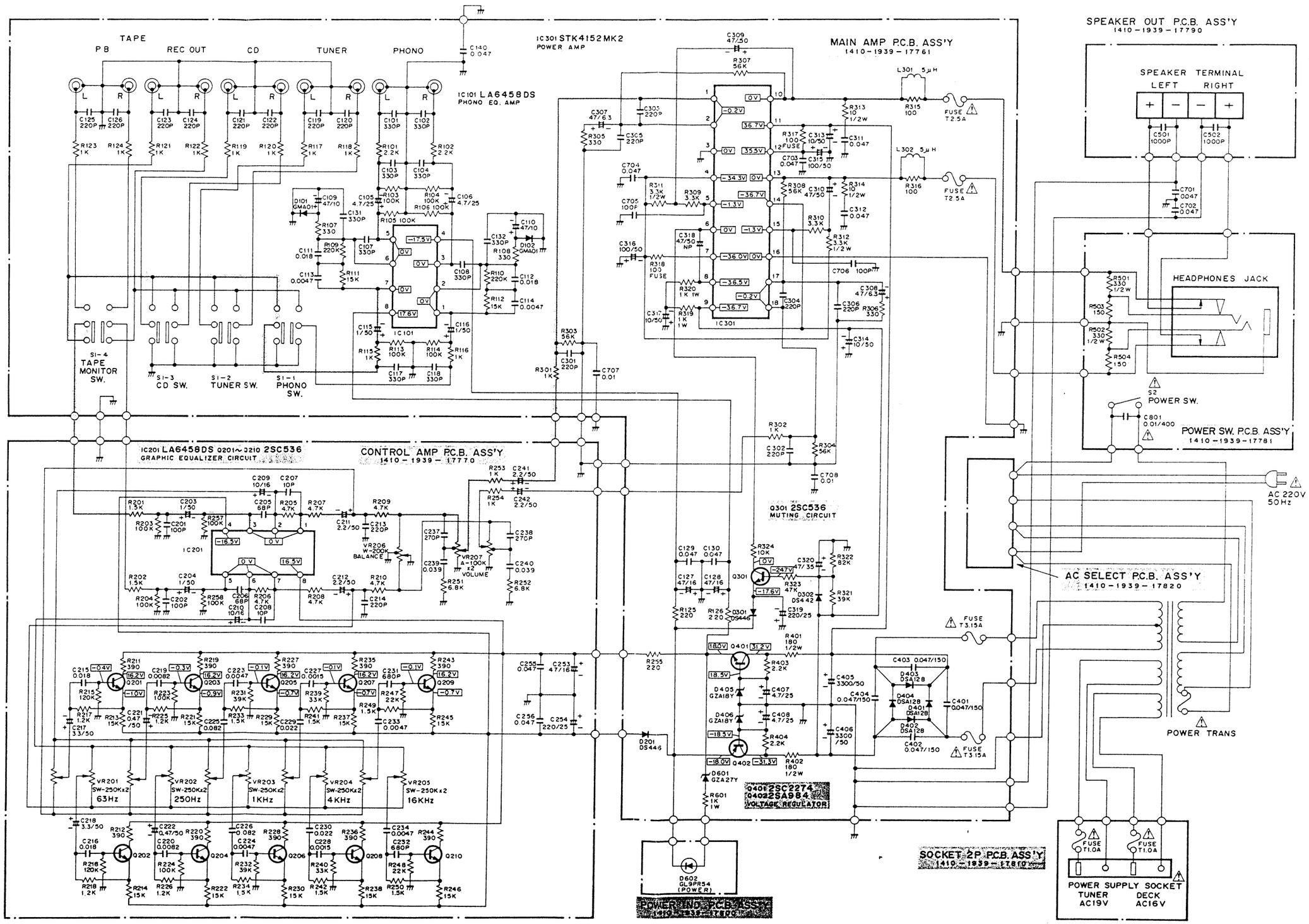
IC PIN NUMBERS DC VOLTAGES																			
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
IC101	LA6458DS	0V	0V	0V	-17.5V	0V	0V	0V	17.6V										
IC301	STK4152	-0.2V	-0.2V	0V	-34.3V	-1.3V	0V	-36.0V	-36.5V	-36.7V	0V	36.7V	35.5V	0V	-36.7V	-1.3V	0V	-0.2V	-0.2V



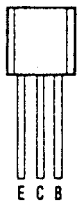
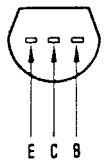
POINT TO POINT WIRING DIAGRAM



SCHEMATIC DIAGRAM



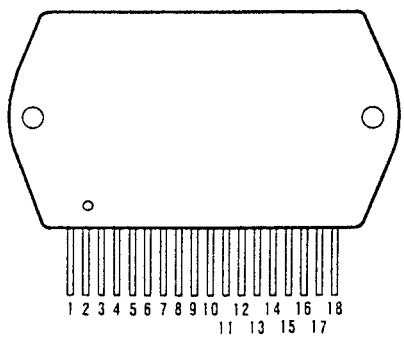
SEMICONDUCTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA 984 2SC 536 2SC 2274		

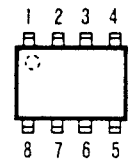
TERMINAL NAME

B — BASE
C — COLLECTOR
E — EMITTER

STK 4152 MK2 BOTTOM VIEW



LA 6458 BOTTOM VIEW



SWITCH POSITION TABLE

No.	Name	Position	No.	Name	Position
S1-1	PHONO Switch	OFF	S1-4	TAPE MONITOR Switch	OFF
S1-2	TUNER Switch	OFF	S2	POWER Switch	OFF
S1-3	CD Switch	OFF			

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Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

NOTES:

1. All resistors values are indicated in "ohm" ($K=10^3$, $M=10^6$).
2. All capacitors values are indicated in "μF" ($P=10^{-12}$).
3. All voltages indicated on the schematics are measured under the following conditions.
   a. Use a V.T.V.M.
   b. All voltages ±10 % with respect to chassis ground
   c. No signals at input terminals
   d. AC input at 220 volts 50 Hz
4. This is a basic schematic diagram.

Because Fisher products are subject to continuous improvement, Fisher Corporation reserves the right to make any changes or modifications without notice.